
Service verification

Testing PRI

There are four tests used to test the Primary Rate Interface:

- the PRI local loopback test
- a PRI self-test performed manually
- the PRI automatic loop test
- the PRI remote loopback test (must run in conjunction with a link diagnostic test at the far end)

Note: X11 release 18 changes the way you enter the card type for some commands. X11 release 17 and earlier uses ENL DCHI, DIS DCHI. X11 release 18 requires ENL DCH, DIS DCH. The X11 release 18 commands are reflected in this document.

PRI local loopback test

This test checks the communication path between the QPC414 Network card and the QPC720 PRI card. It also checks the leads for the J4. It is often performed when the PRI cannot be enabled. The PRI card must be installed, and a cable must connect its J3 connector to a QPC414 Network card.

- 1 Disable the D-channel:

LD 96
DIS DCH x

- 2 Disable the PRI loop:

LD 60
DISL loop

- 3 Disconnect the cable connector from the QPC720 J4 (if attached). Several LEDs will light on the faceplate.

- 4 Attach a female 15-pin connector loopback plug to J4. The loopback plug must have pins 1 and 3, and pins 9 and 11 shorted together.

- 5 Enable the PRI loop:

LD 60
ENLL loop

The green ACT LED will light in a few seconds. If so, the test passed. Continue with the following steps.

If the green ACT light does not come on, retest. Unseat the PRI card between steps 2 and 3.

If the light still does not turn on, try replacing your QPC414 or QPC720 cards, or the connecting cable.

- 6 Remove the loopback plug from the J4 connector.
- 7 Replace the cable connector to the QPC720 J4 (removed in step 3).
- 8 Enable the loop:

LD 60
ENLL loop

- 9 Enable the DCH:

LD 96
ENL DCH x

PRI self-test

The self-test checks speech path continuity, zero code suppression, remote alarm detection, and A&B bit signaling. This test is performed manually, on a per channel or a per frame (24 channels) basis.

The DCH and PRI must be disabled before performing the self-test or call processing is disrupted. To perform the self-test on a specific loop:

- 1** Disable DCH:

LD 96

DIS DCH x

- 2** Disable the PRI loop and run the self-test:

LD 60

DISL loop

SLFT loop

When the system returns OK, it indicates that the hardware is operable.

- 3** Reenable the PRI loop:

LD 60

ENLL loop

The D-channel will reenale automatically.

PRI automatic loop test

The automatic loop test checks the same functions as the self-test. Unlike the self-test, it can be run automatically, as part of the midnight routines.

With the ATLP command set to 1:

- If all 23 channels are idle at midnight, the system disables the card and performs a self-test on all channels.
- If any of the 23 channels are busy at midnight, the system disables one idle channel, chosen at random, and checks it while the card is enabled.

With the ATLP command set to 0, only one channel is tested. The channel tested is randomly selected by software; it cannot be specified.

To perform the remote loopback test, use the following:

LD 60

ATLP 1 or 0

When ATLP 1 is entered, the TTY prints out AUTO TEST ENBL. When ATLP 0 is entered, the TTY prints out AUTO TEST DSBL.

Link diagnostic and remote loopback tests

The remote loopback test and the link diagnostic test are performed manually on a per channel or a per frame (23 channels) basis.

Link diagnostic test

The link diagnostic test, also called the far end loopback test, does not test the Meridian 1 PRI. It puts the PRI in loopback mode at the far end so a remote loopback test can be performed on far end equipment. The PRI channel, loop, or frame tested must be disabled.

Remote loopback test

The remote loopback test, also called the near end loopback test, checks the integrity of the PRI from the Meridian 1 system to the far end. The far end must be put into loopback mode before this test can be performed. The PRI channel, loop, or frame tested must be disabled.

Coordinating the tests

When a technician at the far end asks for loopback mode on the Meridian 1, perform the following steps:

- 1 Disable the D-channel:
 LD 96
 DIS DCH x

- 2 Disable the PRI loop and activate loopback mode:
 LD 60
 DISL loop
 RLBK loop

The QPC720 LBK LED lights.

When a technician at the far end asks for loopback mode on the Meridian 1 to be disabled, perform this step:

- 1 Disabled loopback mode:

LD 60

DLBK loop

The LBK LED turns off.

When a technician at the far end asks for PRI and DCH to be reenabled, perform this step:

- 1 Enable the PRI loop:

LD 60

ENLL loop

OK will print out. The D-channel reenables automatically.

To run the remote loopback test on the Meridian 1, call a technician at the far end and ask for loopback mode at that facility.

When loopback mode at the far end is confirmed, the technician at the far end follows these steps:

- 1 Disable the D-channel:

LD 96

DIS DCH N

- 2 Disable the PRI loop and run the loopback test using:

LD 60

DISL L

RMST L

SLFT OK prints out to indicate a successful test.

- 3 Call the far end technician to disable the loopback test, and to reenables the PRI and DCH. The far end technician enables the PRI:

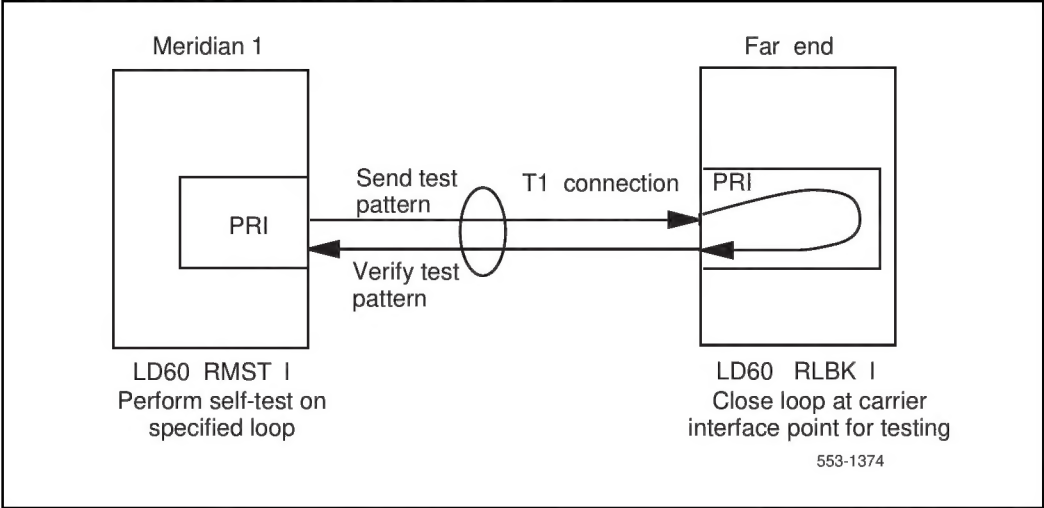
LD 60

ENLL L

OK prints out, and the D-channel reenables automatically.

Figure 9 shows the relationship between the remote loopback test and the link diagnostic test.

Figure 9
PRI remote loopback and link diagnostic tests



Testing DCH

This section describes the following DCH tests. These tests are supported on the QPC757 DCHI card only. MSDL card (NT6D80) tests are shown later in this section.

- Test 100: Interrupt generation
- Test 101: Loopback mode
- Test 200: Interrupt handler
- Test 201: Interrupt handler-to-link interface

DCH tests 100 and 101 (QPC757 DCHI card only)

DCH tests 100 and 101 are isolated hardware tests. Test 100 checks interrupt generation on the DCHI card. Test 101 checks the DCHI loopback capability. If either test fails, a faulty DCHI or a contention problem is indicated. A test failure initiates DCH error messages. See Figure 10.

Tests 100 and 101 must be run in sequential order (tests 200 and 201 can follow). Established calls stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. Reset can be accomplished when the status of the D-channel is established (EST) or released (RLS).

To reset:

LD 96

STAT DCH x (responds either EST or RLS)

RST DCH x

If the DCHI is disabled, it must be enabled before reset can be established.

To enable the DCHI:

LD 96

STAT DCH x (responds RST)

ENL DCH x (if a problem caused the disabled state, RLS occurs;
if the disabled state is cleared, status is EST)

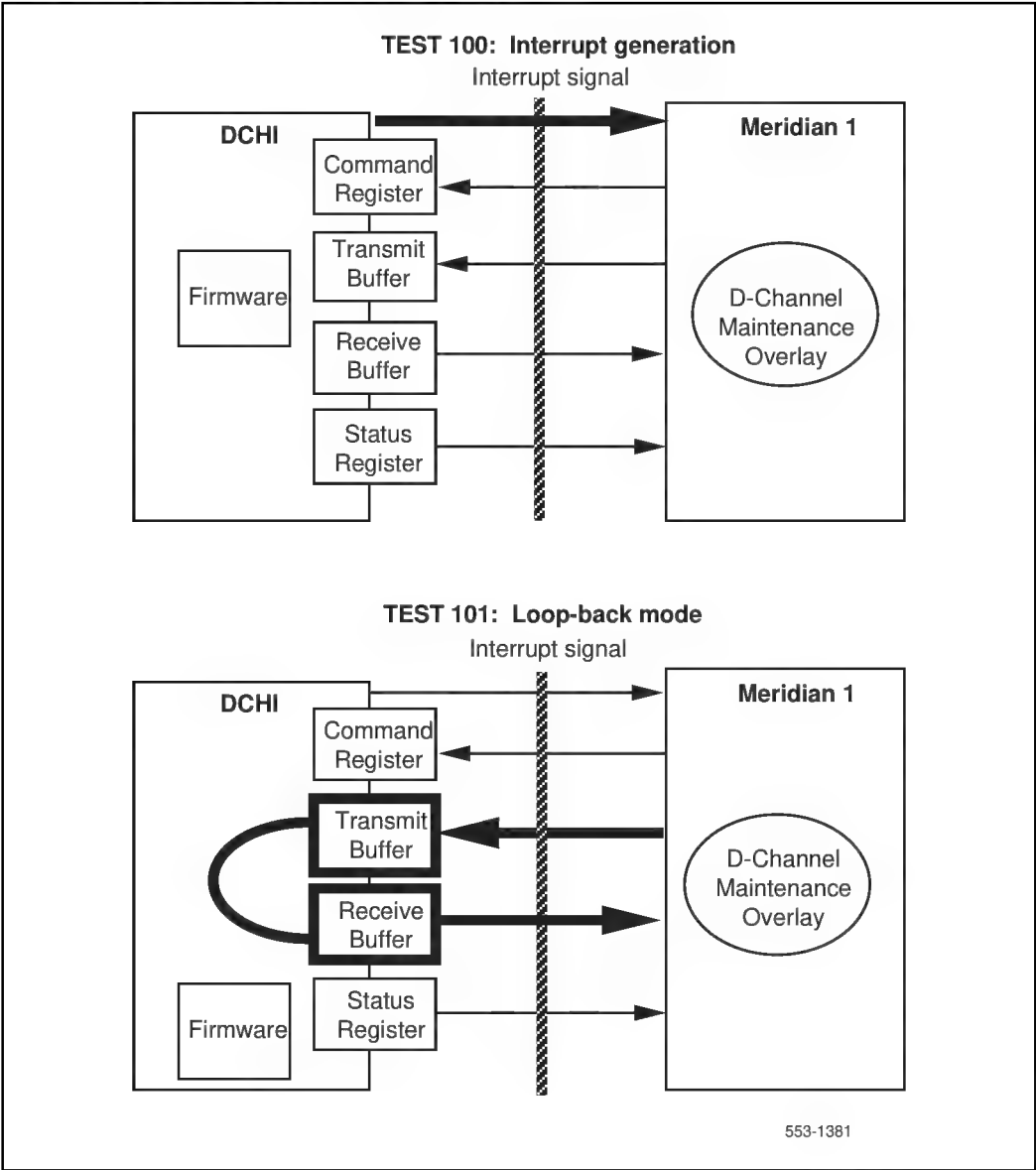
To run test 100 and test 101 after verifying that the DCH is reset:

TEST 100 x

TEST 101 x

OK appears when the test passes successfully.

Figure 10
DCH tests 100 and 101 (QPC757 DCHI card only)



DCH tests 200 and 201 (QPC757 DCHI card only)

DCH tests 200 and 201 are software tests. See Figure 11. Test 200 monitors the DCHI interrupt handler. Test 201 checks the interrupt handler-to-link interface path. A failure of either test indicates software problems. A test failure initiates DCH error messages.

Tests 200 and 201 must be run sequentially after tests 100 and 101. Established calls stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. Reset can be established when the status of the D-channel is established (EST) or released (RLS).

To reset:

LD 96

STAT DCH x (responds either EST or RLS)

RST DCH x

If the DCHI is disabled, it must be enabled before reset can be established.

To enable the DCHI:

LD 96

STAT DCH x (responds RST)

ENL DCH x (if a problem caused the disabled state, RLS occurs;
if the disabled state is cleared, status is EST)

RST DCH x

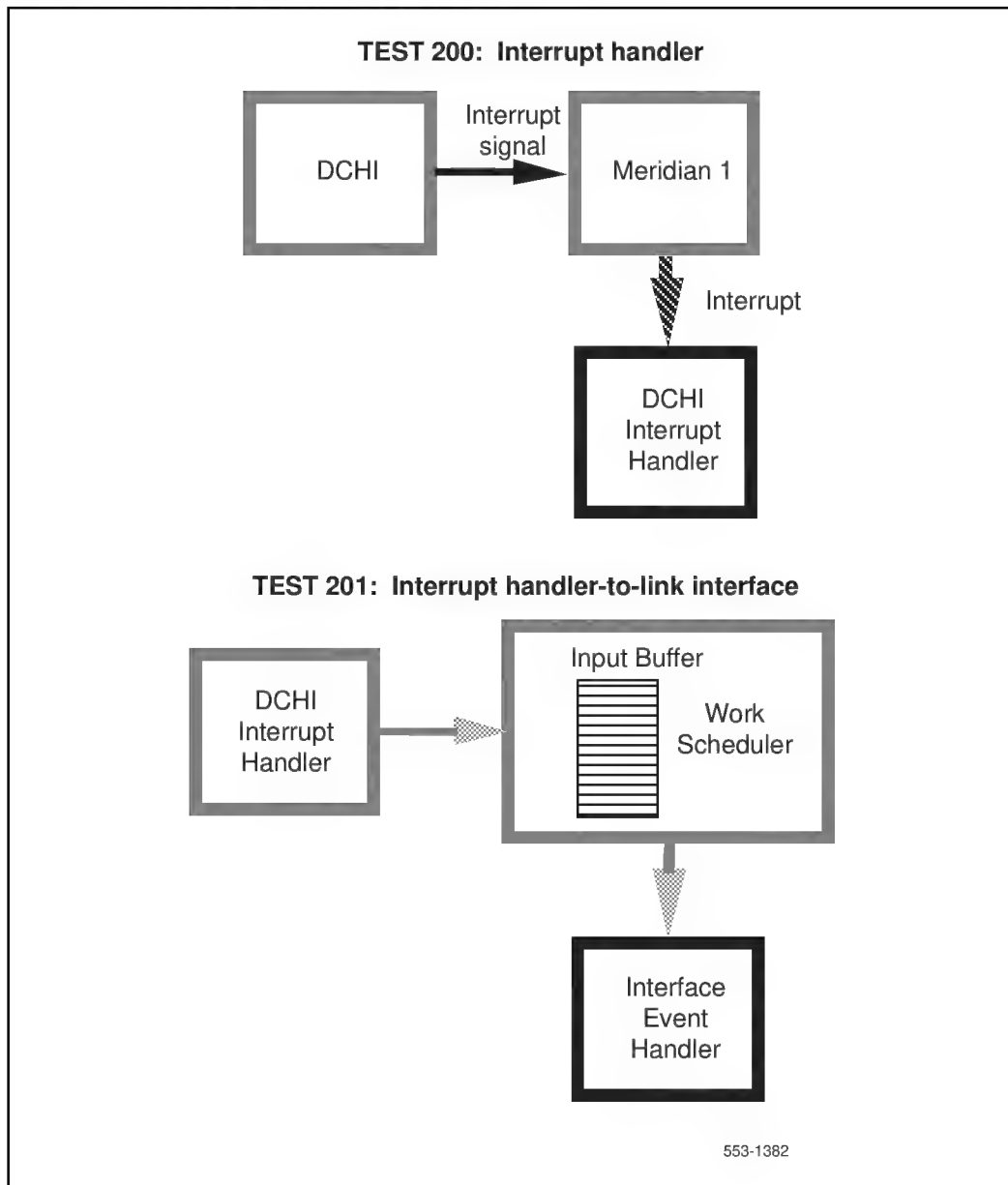
To run test 200 and test 201 after verifying that the DCH is reset:

TEST 200 x

TEST 201 x

OK appears when the test passes successfully.

Figure 11
DCH tests 200 and 201 (QPC757 DCHI card only)



MSDL local loopback test (NT6D80)

To start the local loopback test on the MSDL card, use the following steps. The test checks both MSDL expedited and normal (ring) interfaces.

- 1 Place MSDL in Test state. Enter the:
ENL TEST DCH x x = the D-channel logical address
- 2 Place the MSDL in local loopback mode. Enter:
ENL LLB DCH x x = the D-channel logical address
- 3 Perform the test. Enter:
TEST LLB DCH x x = the D-channel logical address

The response for the expedited interface that carries urgent signaling and maintenance messages between the Meridian 1 CPU and the MSDL MPU follows.

DCH : X XDU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

X is the D-channel logical address
XDU is the expedient message sent around the loop.

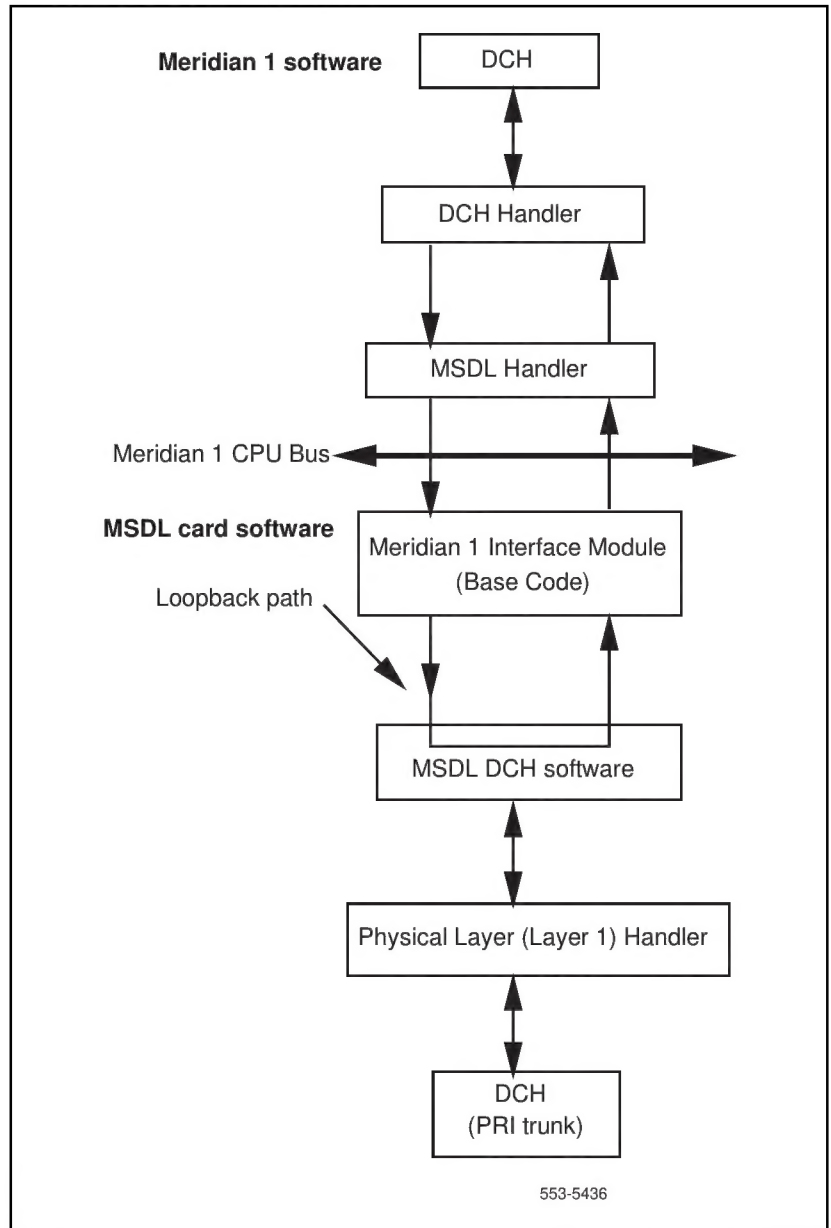
The response for the ring interface that transmits operation data between the Meridian 1 CPU and the MSDL MPU follows.

DCH : X DU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

- 1 If the test fails, check the status of the MSDL card, used by this DCH link, with the **STAT MSDL x FULL** command.
- 2 If the MSDL card may be faulty, disable the card and perform the self-test.
DIS MSDL x x = the MSDL device number
SLFT MSDL x x = the MSDL device number
- 3 If the card passes the test, the problem may lie in incompatible software.

Refer to *Multi-purpose Serial Data Link description* (553-3001-195).

Figure 12
Local loopback test (NT6D80)



MSDL remote loopback tests (NT6D80)

Before beginning this test, verify the following:

- D-channels on both switches are configured on MSDL cards
- DCH links on both switches are set to test mode
- DCH at Switch B is in remote loopback mode (RLB)
- remote capability (RCAP) is MSDL

To place DCH links on both systems in test mode, enter ENL TEST DCH x on Switch A and ENL TEST DCH y on Switch B for the same DCH link (x is the logical address for the DCH link in Switch A and y is the corresponding DCH link in Switch B). The DCH links on both switches are automatically placed in the idle state (IDLE).

- 1 Place the Switch B DCH link in remote loopback state (RLB) with **ENL RLB DCH x**. The DCH link in Switch A must stay in idle.
- 2 From Switch A, perform the loopback test with **TEST RLB x**.

The result of the remote loopback test is displayed on Switch A's console in the following format:

```
DCH : X RLB TEST CONFIRM TIME : <time of day>
TEST : PASS
TEST : FAIL - NO DATA RCV FAR END
TEST : FAIL - CORPT DATA RCV FAR END
TEST : FAIL - REASON UNKNOWN
```

TEST : FAIL may indicate a problem in the physical link between the two switches, or faulty equipment in either switch. Check the connections, and verify the status of the MSDL and PRI trunk cards used for this link. Refer to *ISDN Primary Rate Interface maintenance* (553-2901-500) for detailed troubleshooting procedures.

- 3 Place the Switch B DCH link back to the idle state, with the **DIS RLB y** command.
- 4 If you think the MSDL card used in either switch has failed, check the status of the DCH link and the status of the MSDL card by entering **STAT MSDL x FULL**.
- 5 If the MSDL card may be faulty, disable the card and perform the self-test.
DIS MSDL x
SLFT MSDL x
- 6 If the card passes the test, the problem may lie in incompatible software. Refer to *Multi-purpose Serial Data Link description* (553-3001-195).

Figure 13
Remote loopback tests (NT6D80)

